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FOR SEPTEMBER 2002 PUBLIC MEETING
DISCUSSION PURPOSES ONLY**

Proposed Airborne Toxic Control Measure

**To Reduce Diesel Particulate Matter Emissions from
In-Use Stationary Diesel-Fueled CI Engines
Greater Than Or Equal To 50 Horsepower**

And

**To Provide Initial Record of Compression Ignition
(Diesel- and Non-Diesel-Fueled) Engines Greater Than
Or Equal To 50 Horsepower**

**California Environmental Protection Agency
Air Resources Board**

September 2002

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PROPOSED REGULATION ORDER

**AIRBORNE TOXIC CONTROL MEASURE (ATCM) TO REDUCE DIESEL
PARTICULATE MATTER EMISSIONS FROM IN-USE STATIONARY DIESEL-
FUELED COMPRESSION IGNITION (CI) ENGINES GREATER THAN OR
EQUAL TO 50 HORSEPOWER AND TO PROVIDE INITIAL RECORD OF CI
ENGINES GREATER THAN OR EQUAL TO 50 HORSEPOWER**

Adopt new section xxxxxx, title 17, California Code of Regulations, to read as follows:

17 CCR, section xxxxxx. In-Use Stationary Diesel-Fueled Compression Ignition (CI) Engine Airborne Toxic Control Measure and Initial Recording Requirements for In-Use CI Engines Greater Than or Equal to 50 Horsepower.

(a) Purpose

- (1) Diesel particulate matter (PM) was identified in 1998 as a “non-threshold” toxic air contaminant. “Non-threshold” means that there is not a threshold exposure level below which no significant adverse health effects are anticipated. As such, in accordance with Health and Safety Code Section 39666, this airborne toxic control measure (ATCM) shall be employed to reduce exposure to the diesel PM from stationary diesel-fueled engines. The ATCM also requires owners and operators of stationary diesel-fueled engines to provide the districts with a record of where stationary CI engines - including those that are not currently using diesel-fuel - are located and how they are operated.

(b) Effective Date

- (1) No later than 120 days after the approval of this section by the Office of Administrative Law, each air pollution control and air quality management district (district) must:
 - (A) Implement and enforce the requirements of this section; or
 - (B) Propose their own airborne toxic control measure (ATCM) to reduce diesel PM from in-use stationary diesel-fueled compression ignition (CI) engines as provided in Health and Safety Code section 39666(d).

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(c) Applicability

- (1) Except as provided in subsection (d), this section applies to owners or operators of in-use stationary CI engines having a rated brake horsepower greater than or equal to 50, used in prime or emergency standby applications.

(d) Exemptions

- (1) This section does not apply to owners or operators of in-use stationary CI engines primarily used in agricultural operations¹ that are exempted from permit in accordance with Health and Safety Code Section 42310.
- (2) This section does not apply to in-use stationary CI engines having a rated brake horsepower of less than 50 horsepower.
- (3) The requirements defined in subsection (f)(3) do not apply to owners or operators of permitted in-use stationary diesel-fueled compression ignition engines used in emergency standby and prime applications that were required through written authorization by the district, prior to the effective date of this regulation, to meet either the minimum technology requirements or the performance standards defined in the *Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines, October 2000*.
- (4) The requirements defined in subsections (f)(1), (f)(2), and (f)(3) do not apply to in-use stationary diesel-fueled CI engines that are used solely for the training of Department of Defense personnel and are required by Department of Defense Directive or Air Force Space Command Instruction to be in the same configuration as their weapon system counterpart.
- (5) The requirements defined in subsections (f)(1), (f)(2), and (f)(3) do not apply to in-use stationary diesel-fueled CI engines operating on San Nicholas and San Clemente Islands. The Ventura County Air Pollution Control District APCO and the South Coast Air Quality Management District APCO shall periodically review the land use plans for the island in their jurisdiction. If the land use plans are changed to allow public use of the islands, the exemption from the requirements in subsections (f)(1), (f)(2), and (f)(3) shall no longer apply.

1) ARB staff is currently working with California agricultural interests to develop an approach to address in-use agricultural engines.

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(6) Prior to January 1, 2010, owners or operators of in-use stationary diesel-fueled CI engines may file a Request for Exemption from the requirements defined in subsection (f)(3). The district APCO may approve a Request for Exemption if the following criteria are met:

- (A) the engine is located at least 2 mile from the nearest receptor, and
- (B) the engine operates less than or equal to 500 hours per year.
- (C) Before providing this exemption, the district APCO shall:
 - (i) Consider the following information: county land use plans, the current use of the surrounding land, the current and anticipated zoning designations, additional CI engines operating on-site; and;
 - (ii) Require that any exemption shall be valid for no longer than three years. At the end of the three year period, the owner or operator may reapply.

Any exemptions in effect on January 1, 2010 shall cease to be valid and no exemptions shall issued or renewed after January 1, 2010.

(e) Definitions

For purposes of this section, the following definitions apply

- (1) "Alternative Fuel" means any fuel used in a compression ignition engine that is not diesel fuel or CARB diesel fuel and that has been verified through the Diesel Emission Control Strategy Verification Procedure (DECSVP).
- (2) "Agricultural Operations" means the growing and harvesting of crops or the raising of fowl or animals for the primary purpose of making a profit, providing a livelihood, or conducting agricultural research or instruction by an educational institution.
- (3) "Air Pollution Control Officer" means the Executive Officer of a district, or his or her designee.
- (4) "ALSF-1 and ALSF-2" mean high intensity approach lighting systems with sequenced flashers used at airports to illuminate specified runways during category II and III weather conditions. Category II: decision height of 100 feet and runway visual range of 1,200 feet. Category III: no decision height or decision height below 100 feet and runway visual range of 700 feet.

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- (5) "Baseline Emissions" and "Baseline Testing" means the emission levels measured from, or the emission testing of, an engine that is in its current operating configuration, prior to being retrofitted or modified in order to meet the requirements of this subsection.
- (6) "CARB Diesel Fuel" means any diesel fuel that meets the specifications defined in subsection (e)(9) and meets the specifications defined in 13 CCR 2281 and 13 CCR 2282 or is an emission equivalent formulation.
- (7) "Compression Ignition (CI) Engine" means an internal combustion engine with operating characteristics significantly similar to the theoretical diesel combustion cycle.
- (8) "Diesel Emission Control Strategy Verification Procedure (DECSVP)" means the ARB regulatory procedure (13 CCR 2700-2710) which could be used to verify the reductions of diesel PM and/or NOx from in-use diesel engines using a particular emission control strategy.
- (9) "Diesel Fuel" means any fuel that meets the following specification: *ASTM D975 – 98, Standard Specification for Diesel Fuel Oils*; includes No. 1-D, No. 1-D low sulfur, No. 2-D, No. 2-D low sulfur, and No. 4-D.
- (10) "Diesel-Fueled" means fueled by diesel fuel, CARB diesel fuel, or jet fuel, in whole or part.
- (11) "Generator Set" means a compression ignition engine coupled to a generator used as a source of electricity.
- (12) "Diesel Particulate Filter (DPF)" means an emission control technology that reduces PM emissions by trapping the particles in a flow filter substrate where it is oxidized or burned off, once the filter reaches a certain temperature.
- (13) "Diesel Particulate Matter (PM)" means the particles found in the exhaust of diesel-fueled CI engines which may agglomerate and adsorb other species to form structures of complex physical and chemical properties. Diesel-particulate matter is commonly divided into three main fractions: 1) the Solid Fraction (elemental carbon, ash), 2) Soluble Organic Fraction (organic material derived from lube oil and fuel), and 3) Sulfate particles (SO₄).
- (14) "District" means an air pollution control district or air quality management district created or continued in existence pursuant to provisions of Part 3 (commencing with section 40000) of the California Health and Safety Code. Each district is headed by an Air Pollution Control Officer (APCO).

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(15) "Emergency Standby CI Engine" means a stationary CI engine used only as follows: 1) emergency use; 2) maintenance and operational testing; 3) emission testing for purposes of showing compliance with subsection (f)(3)(A)(i). An emergency standby CI engine may not be operated to supplement a primary power source when the load capacity or rating of the primary power source has been either reached or exceeded.

(16) "Emergency Use" means used to mitigate any of the following:

- (A) failure of electrical power;
- (B) failure of regular natural gas supply;
- (C) flood mitigation;
- (D) sewage overflow mitigation;
- (E) pumping of water for fire suppression or protection;
- (F) for powering airport runway approach lights (ALSF-1 and ALSF-2 systems only) under category II or III weather conditions.

[Note: Staff evaluating how best to address "loss of service" and "internal power failure"]

(17) "Emission Control Strategy" means any device, system, or strategy employed with a diesel-fueled CI engine that is intended to reduce emissions. Examples of diesel emission control strategies include, but are not limited to, particulate filters, diesel oxidation catalysts, selective catalytic reduction systems, fuel additives used in combination with particulate filters, alternative diesel fuels, and combinations of the above.

(18) "Executive Officer" means the executive officer of the Air Resources Board, or his or her delegate.

(19) "In-Use"(CI engine) means not a "new" CI engine.

(20) "Jet fuel" means fuel meeting the following specification
ASTM D 1655 – 98, Standard Specification for Aviation Turbine Fuels;
includes
Jet A, Jet A-1, and Jet B.

MIL-DTL-5624T, Turbine Fuel, Aviation, Grades JP-4, JP-5, and JP-5/JP8 ST.

MIL-T-83133D, Turbine Fuel, Aviation, Kerosene Types, NATO F-34 (JP-8) and NATO F-35; NATO F-35 similar to (JP-8).

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- (21) "Location" means any single site at a building, structure, facility, or installation.
- (22) "Model Year" means the stationary CI engine manufacturer's annual production period, which includes January 1st of a calendar year, or if the manufacturer has no annual production period, the calendar year.
- (23) "New" (CI engine) means a stationary CI engine that is either:
- (A) an engine installed at a new or existing stationary source after the effective date of section xxx, "The New Diesel-Fueled Engine ATCM." with the following exception:
 - (i) An exact replacement stationary CI engine that is installed on a temporary basis for purposes of allowing for maintenance of the existing permanent engine is not considered a new engine.
 - (B) an engine relocated from an offsite location after the effective date of section xxx, "The New Diesel-Fueled Engine ATCM."
 - (C) an engine that has been reconstructed after the effective date of section xxx, "The New Diesel-Fueled Engine ATCM." where the cost of a single reconstruction is greater than or equal to 50 percent of the purchase price of a new similarly sized engine (basic equipment only).
- (24) "Nitrogen Oxides" means compounds of nitric oxide (NO), nitrogen dioxide (NO₂), and other oxides of nitrogen. Nitrogen oxides are typically created during combustion processes, and are major contributors to smog formation and acid deposition. NO₂ is a criteria air pollutant, and may result in numerous adverse health effects.
- (25) "Non-Methane Hydrocarbons (NMHC)" means the sum of all hydrocarbon air pollutants except methane. NMHCs are precursors to ozone formation.
- (26) "Owner or operator" means any person subject to the requirements of this section, including but not limited to:
- (A) An individual, trust, firm, joint stock company, business concern, partnership, limited liability company, association, or corporation including but not limited to, a government corporation;
 - (B) Any city, county, district, commission, the state or any department, agency, or political subdivision thereof, any interstate body, and the federal government or any department or agency thereof to the extent permitted by law; or

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- (C) A project proponent and any of its contractors or subcontractors.
- (27) "Prime CI Engine" means a stationary CI engine that is not an emergency standby engine.
- (28) "Rated Brake Horsepower" means the rating specified for the engine by the manufacturer.
- (29) "Receptor" includes, but is not limited to, any hospital, school, day care center, work site, business, residence, and permanent campground.
- (30) "Stationary CI Engine" means a CI engine that is either: 1) used in a piece of equipment that is designed to remain in one location for the duration of its useful life, or 2) used in an equipment unit that can be carried from one location to another but remains at a single location for more than 12 consecutive months. Examples of stationary CI engine applications include, but are not limited to: electric power generator sets, grinders, rock crushers, sand screeners, cranes, cement blowers, air compressors, and water pumps.
- (31) "Stationary Source" means an emission unit or aggregation of emission units which are located on the same or contiguous properties and which units are under common ownership or entitlement to use. Stationary sources also include those emission units or aggregation of emission units located in the California Coastal Waters. "Emission Unit" means any article, machine, equipment, contrivance, process, or process line which emit(s) or reduce(s), or may emit or reduce, the emissions of any air contaminant, except motor vehicles.
- (32) "Verified Diesel Emission Control Strategy" means an emission control strategy designed primarily for the reduction of diesel PM emissions that has been verified per the "Diesel Emission Control Strategy Verification Procedure" [see subsection (e)(8)].

(f) Requirements

- (1) Fuel Standards for In-Use Stationary CI Engines
- (A) Owners or operators opting to use diesel fuel in their stationary CI engine(s) in meeting in whole or part the requirements of subsection (f)(3), shall use diesel fuel as lawful for use or sale in California as a vehicular diesel fuel, as defined in 13 CCR 2282.
- (B) Owners or operators opting to use a fuel other than diesel fuel in their stationary CI engine(s) in meeting in whole or part the requirements of

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subsection (f)(3), shall be limited to using an alternative fuel as defined in subsection (e). **[Note: Staff evaluating whether additional language is required to address dual-fueled engines, e.g. fueled by diesel/CNG]**

(2) Emergency Standby Diesel-Fueled CI Engine Hours of Operation

- (A) An owner or operator may only operate an emergency standby diesel-fueled CI engine under the following circumstances:
 - (i) For emergency use, an unlimited number of hours; and
 - (ii) For emission testing, to show compliance with subsection (f)(3)(A)(i), or, if necessary, to re-certify engine in accordance with the requirements of the Nuclear Regulatory Commission (NRC); an unlimited number of hours; and
 - (iii) For maintenance of the engine and testing of the engine to evaluate its ability to perform, so long as total hours of operation do not exceed 50 hours per calendar year. **[Note: Staff is considering a tiered approach in lieu of the 50 hour limit, See Discussion Insert below]**

(3) Emission Standards for In-Use Stationary Diesel-Fueled CI Engines

- (A) Except as provided in subsection (d), all in-use stationary diesel-fueled CI engines operated in California must meet, in accordance with the appropriate compliance schedule as defined in subsection (j), the following requirements:
 - (i) For Emergency Standby Diesel-Fueled CI Engine Applications **[Note: Staff is considering a tiered approach, see Discussion Insert below]**

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**DISCUSSION INSERT
PROPOSED CHANGE TO DRAFT PM EMISSION STANDARD**

PREVIOUS APPROACH - DRAFT EMISSION STANDARDS: All in-use stationary diesel fueled CI engines used in emergency standby (E/S) applications must meet the following emission standards

For Diesel PM Emissions

- 1) 85% reduction from baseline levels, or
- 2) 0.15 g/bhp-hr, or
- 3) Be replaced with an engine meeting the New Engine Standards.

For NMHC, NO_x, NO₂, and CO

- 1) NMHC: ≤10% increase from baseline
- 2) NO_x: ≤10% increase from baseline
- 3) NO₂: weight fraction of NO₂ to NO_x ≤ 20% from baseline
- 4) CO: ≤10% increase from baseline

ISSUE: The cost of retrofitting or replacing a high-emitting (~1.0 g/bhp-hr PM emission rate), low-use stationary E/S engine to meet a 0.15 g/bhp-hr standard is high. The potential cancer risk posed by such an engine is dependent on hours of operation. For extremely low-use (<15 hours per year) the risk is estimated by staff is generally at less than 10/million with no control.

- Preliminary cost analysis shows retrofitting an average-sized (550 hp) in-use stationary diesel-fueled CI engine with a diesel particulate trap technology can range from \$13,000 to \$41,000. Replacement of the engine is estimated at \$65,000.
- Staff estimates that a low-use (~15 hours/year) 550 hp emergency standby diesel-fueled CI engines emitting PM at a high rate (1.0 g/bhp-hr) poses a risk of less than 10/million in most areas.

PROPOSED CHANGES TO DIESEL PM EMISSION STANDARDS: Rather than requiring all E/S applications to meet the same PM emission standard – 0.15 g/bhp-hr, allow those applications that operate an extremely low number of hours to meet a less stringent – but still health protective – PM emission standard. Those that operate more hours are required to meet more stringent standards. Below is one possible approach that incorporates this idea (see 2 and 3):

- 1) 85% from baseline levels (1.0 g/bhp-hr is default value if baseline test is not conducted or baseline data is not available)
- 2) E/S engines that operate 15 hours or less per year, for maintenance and testing purposes, would be allowed to continue to emit diesel PM at their current rate (~1.0 g/bhp-hr or less.)
- 3) E/S engines that operate more than 15 hours per year, for maintenance and testing purposes, would be required to meet the applicable PM emission rate indicated in the table below:

PM EMISSION RATE (g/bhp-hr)	MAXIMUM ALLOWABLE ANNUAL HOURS OF OPERATION (Maintenance and Testing)	TYPE OF TECHNOLOGY TO MEET EMISSION RATE (Assume: 1 g/bhp-hr)
0.50	30	DOC + emulsified fuel
0.40	40	DOC + emulsified fuel; DPF + CARB diesel
0.15	100	DPF+LS Diesel

- 4) Replace engine with an engine meeting the New Engine Standards.

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(ii) For Prime Diesel-Fueled CI Engine Applications

- (1) Reduce diesel PM emissions by greater than or equal to 85 percent, by weight, from baseline levels. Diesel PM control strategies used to meet these requirements may not result in an increase in NMHC, NO_x, or CO emissions greater than 10 percent from baseline levels, or result in the NO₂ weight fraction of total NO_x exceeding 20 percent of the total baseline NO_x emissions on a mass basis.

Or

- (2) Emit less than or equal to 0.01 g/bhp-hr of diesel PM. Diesel PM control strategies used to meet these requirements may not result in an increase in NMHC, NO_x, or CO emissions greater than 10 percent from baseline levels, or result in the NO₂ weight fraction of total NO_x exceeding 20 percent of the total baseline NO_x emissions on a mass basis.

Or

- (3) Be replaced with an engine or technology that emits at levels less than or equal to the emission limits defined in section xxx, "The New Diesel-Fueled ATCM."

(4) Recordkeeping, Reporting, and Monitoring Requirements

(A) Initial Recording Requirements

- (i) Except as provided in subsection (d) and subsection (f)(4)(A)(ii), and no later than 6 months after the effective date of this regulation, each owner or operator of a stationary CI engine shall be required to provide the following information to the District APCO:
- (1) the name of applicant, and a contact person including mailing address and telephone number;
 - (2) brief description(s) of each operating engine's use; and engine location,
 - (3) the following engine information: make, model, engine family, model year, offroad certification level (if applicable), rated brake horsepower, brake specific fuel consumption, and serial number, for each operating engine;

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- (4) the following information (if applicable) on emission control strategies used (not limited to diesel PM controls): technology (e.g., diesel particulate filter, oxidation catalyst, exhaust gas recirculation, injection timing retard), emissions controlled (e.g., PM, NOx, CO, NMHC), manufacturer, and identification number for each operating engine;
 - (5) the fuel type, specification, and quantity used; and
 - (6) estimated annual hours of operation.
- (ii) The District APCO may exempt the owner or operator from providing all or part of the information identified in subsection (f)(4)(A)(i), if there is a current record of the information in the owner or operators permit-to-operate.
- (iii) Upon the written request by the Executive Officer, the District APCO shall provide to the Executive Officer a written report of all information identified in subsection (f)(4)(A)(i).

(B) Initial Demonstration of Compliance

- (i) An owner or operator of an in-use stationary diesel-fueled CI engine(s) subject to the requirements of section (f)(3)(A) shall provide emission test results in accordance with the requirements of subsection (l) for purposes of showing compliance with the requirements of subsection (f)(3)(A). Emission test results shall be submitted to the district APCO by the compliance date specified in section (g) or (h), as applicable.

(C) Exempted Engines

- (i) A non-resettable hour meter must be installed on all engines exempted from the requirements of subsection (f)(3)(A) pursuant to subsections (d)(3) and (d)(6).
- (ii) An owner or operator exempted from the requirements of subsection (f)(3)(A) pursuant to subsections (d)(3) and (d)(6) shall keep records of the number of hours the engines are operated on a monthly basis. Such records shall be retained for a minimum of 36 months from the date of entry and made available to the District staff upon request.

(D) Emergency Standby Engines

- (i) A non-resettable hour meter must be installed on all engines

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subject to the requirements of subsection (f)(3)(A)(i). An owner or operator of an emergency standby diesel-fueled CI engine shall keep a monthly log of usage that shall indicate the following:

- (1) Hours of operation (total)
- (2) Hours of operation (maintenance and testing)
- (3) Hours of operation (emission testing to show compliance with (f)(3)(A)(i) or NRC re-certification)
- (4) Hours of operation (emergency use)
- (5) For emergency use, the nature of use

- (E) All DPFs installed pursuant to the requirements in subsection (f)(3)(A) must be installed with a backpressure monitor to notify the owner or operator when the high backpressure limit of the engine is approached.
- (F) The District APCO reserves the right to require additional monitoring equipment dependent on the emission control strategy used to meet the requirements of subsection (f)(3)(A).

(g) Compliance Schedule

- (1) Except as provided in subsection (h), each owner or operator of an in-use stationary diesel-fueled CI engine shall be required to meet the requirements of subsection (f)(3)(A) in accordance with the following schedule:
- (A) All 1989 model year engines and pre-1989 model year engines must be in compliance by no later than July 1, 2005.
- (B) All 1990 model year and post-1990 model year engines, to pre-1996 model year engines must be in compliance by no later than July 1, 2006.
- (C) All 1996 model year engines and post-1996 model year engines must be in compliance by no later than July 1, 2007.

(h) Compliance Plan for Owners or Operators of Four or More Engines

- (1) Owner or operators of four or more in-use stationary diesel-fueled CI engines subject to the requirements of subsection ((f)(3)(A) may submit to the District APCO an alternative compliance schedule as part of a Compliance Plan to be developed in accordance with the requirements of this subsection.

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- (2) The Compliance Plan must be submitted to the District APCO no later than 180 days prior to the earliest applicable compliance date specified in subsection (g).
- (3) The Compliance Plan, when implemented, must result in compliance with subsection (f)(3)(A) in accordance with the following schedules.

1989 and Pre-1989 Model Year Engines

Percent of Engines	Compliance date
25%	July 1, 2005
50%	July 1, 2006
75%	July 1, 2007
100%	July 1, 2008

1990, Post-1990 thru Pre-1996 Model Year Engines

Percent of Engines	Compliance date
30%	July 1, 2006
60%	July 1, 2007
100%	July 1, 2008

1996 and Post-1996 Model Year Engines

Percent of Engines	Compliance date
50%	July 1, 2007
100%	July 1, 2008

- (4) The Compliance Plan shall include, at a minimum, the following information:
- (A) name of the owner or operator, a contact person, mailing address (street and electronic), and telephone number;
 - (B) a brief description of the engine(s) use and location;
 - (C) the following engine(s) information: make, model, manufacture year, rated brake horsepower, brake specific fuel consumption, and serial number;
 - (D) a control strategy plan for each engine that when implemented will result in compliance with subsection (f)(3)(A). If applicable, the plan should include the diesel emission control strategy verification executive order number for control strategies that have been approved through the DECSVP.

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- (E) Compliance schedule indicating when the engine(s) will be in compliance with the requirements of subsection (f)(3)(A).
- (5) The District APCO may exempt the owner or operator from providing all or part of the information identified in subsection (h)(4), if there is a current record of the information in the owner or operators permit-to-operate or notification pursuant to subsection (f)(4)(A).
- (6) Within 30 calendar days of receipt of a Compliance Plan, or a time period mutually agreed upon by the owner or operator and the District APCO, the District APCO shall inform the owner or operator in writing if the Compliance Plan is complete or deficient. If deemed deficient, the District APCO shall identify the specific information required to make the Compliance Plan complete.
- (7) Within 60 calendar days of the application being deemed complete, or a time period mutually agreed upon by the owner or operator and the District APCO, the District APCO shall approve or disapprove the Compliance Plan.

(i) Emission Testing

- (1) Emission testing of an in-use stationary diesel-fueled CI engine shall be done in accordance with the methods specified in subsection (j).
- (2) For purposes of emission testing, the particulate matter emissions from a stationary diesel-fueled CI engine that uses a fuel that is mixture of diesel fuel and another fuel(s), shall be considered to be 100% diesel PM.
- (3) Emission testing for the purposes of determining the percent increase/decrease from baseline shall include baseline and emission control strategy testing.
 - (A) Baseline testing may be conducted with the emission control strategy in place, if the emission control strategy is shown to the satisfaction of the district APCO not to influence the emission test results.
 - (B) Control strategy testing must be performed on the in-use stationary diesel-fueled CI engine with full implementation of the emission control strategy.

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(C) Percent increase/decrease = $100 \times (\text{baseline emissions} - \text{control strategy emissions}) / \text{baseline emissions}$.

- (4) Emission testing for the purposes of demonstrating compliance with an emission level must be performed on the in-use stationary diesel-fueled CI engine with the emission control strategy fully implemented.
- (5) Upon approval by the District APCO, off-road engine certification test data for the in-use stationary diesel-fueled CI engine, engine manufacturer test data, emission test data from a similar engine, and emission test data used in meeting the requirements of the DECSVP for the emission control strategy implemented, can be used in whole or part to meet the emission test requirements of this subsection.

(j) Test Methods

[Note: Staff currently evaluating which test methods are most appropriate for diesel-fueled engines.]

- (1) The following test methods shall be used to determine diesel PM, NO_x, CO and NMHC emission rates:
 - (a) Diesel PM emission testing shall be done in accordance with ARB Method 5; NO_x, CO and NMHC emission testing shall be done in accordance with ARB Method 100.
 - (i) The tests are to be carried out under steady state operation. Test cycles and loads shall be in accordance with ISO-8178 Part 4 or alternative test cycle approved by the district APCO. If an alternative cycle is requested, additional engine or operational duty cycle data may be required.
 - (ii) PM, NO_x, CO, and NMHC emissions shall be reported for each test mode and as a weighed average according to the provisions of ISO 8178 Part 4. Emissions must be reported in accordance with the applicable ARB Method and in gram per brake horsepower hour (g/bhp-hr).
 - (iii) The projected total diesel PM catch for any ARB Method 5 test run must be greater than or equal to 50 mg.
- (2) Alternatives to the test methods listed in subsection (j)(1), which are shown to accurately determine the emission rate of diesel PM, NO_x, NMHC, or CO may be used upon the approval of the District APCO.

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- (3) Nitrogen dioxide (NO₂) measurement shall be done in accordance with the procedure specified in the DECSVP, Section 2706 (a).

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